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Division of Environmental Health
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For Water and Wastewater System Operators and Owners

Northern Flows

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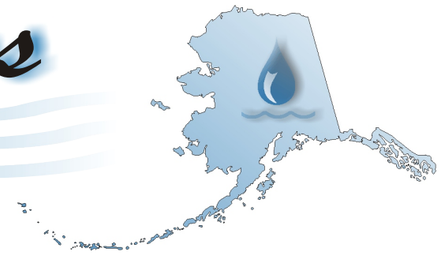


Alaska's Drinking Water and Wastewater Program Newsletter
Issue 12 • Fall 2002

Message from the Manager

It is transition time here at the Alaska Department of Environmental Conservation (ADEC), just as it is for the other state agencies. A gubernatorial election like the one we had this month will bring about many changes, the full extent we won't know for some time. The most immediate changes will affect the upper management of many departments, like ADEC, and we will most likely see new Commissioners, as well as new Directors. I am taking this opportunity to say "Thank you" to our current leaders Commissioner Michele Brown, Deputy Commissioner Kurt Fredrikkson, and the Director, Division of Environmental Health, Janice Adair. All of them have been very supportive of the Drinking Water and Wastewater (DW/WW) Program and we have been very fortunate to have such visionary leadership. The new Director for the Division of Environmental Health is unknown at this time, but I do know that it will take years to bring them to the level Janice Adair has attained. My only consolation in seeing Ms. Adair leave ADEC, is knowing that my friend, Gregg Grunenfelder, the Director for the Drinking Water Program for the State of Washington, will gain from our loss. One thing for certain, Gregg will not have to educate Ms. Adair on the alphabet soup of Drinking Water rules because they have become second nature to her.

With yet another transition, our all too short summer now consists of pictures and memories. I had a great summer, and hopefully, you did also. In my last *Message from the Manager,* I focused on being "proactive" and "responsible." So hopefully, we didn't defer too many projects from our summer to this fall, because if you haven't noticed, this fall has been wetter than normal and the snowline is quickly moving down the mountains.

This issue of the newsletter contains our usual informative technical articles as well as two articles that reflect the personal thoughts from DW/WW Program staff on both important and sometimes contentious issues. These issues are: "Rules, Regulations, and Public Health Protection" and "Drinking Water and Wastewater Program Fees." You may think that working for a state regulatory agency with a public health mission to ensure safe drinking water is easy, and that ADEC DW/WW Program staff are heartless bureaucrats. This perception is far from reality. Consistently and successfully implementing and enforcing state regulations is a stressful job. For some staff, billing a consulting engineer or a public water system owner for a drinking water or wastewater fee activity is also an uncomfortable part of their daily job activities. I plan to include articles from DW/WW Program staff that reflect their philosophies as they pertain to drinking water and wastewater activities and issues on a routine basis. I believe these articles allow a more complete perspective of the staff in the DW/WW Program and show the balance we try to put in our daily jobs and overall lives. I also want to take this opportunity to introduce four new DW/WW Program staff in the Anchorage Office: Leticia Tadina, Env. Technician; Leilua Fomai, Administrative Clerk; Chris Love, Env. Specialist (DW Compliance); and Michael Knapp, Env. Specialist (DW Protection).

Have a great fall, and don't defer preparing yourself and your water or wastewater system for our winter season. If you have any comments or questions about any articles in *Northern Flows,* please don't hesitate to call me or send an E-mail to me at : james_weise@envircon.state.ak.us

James R. Weise

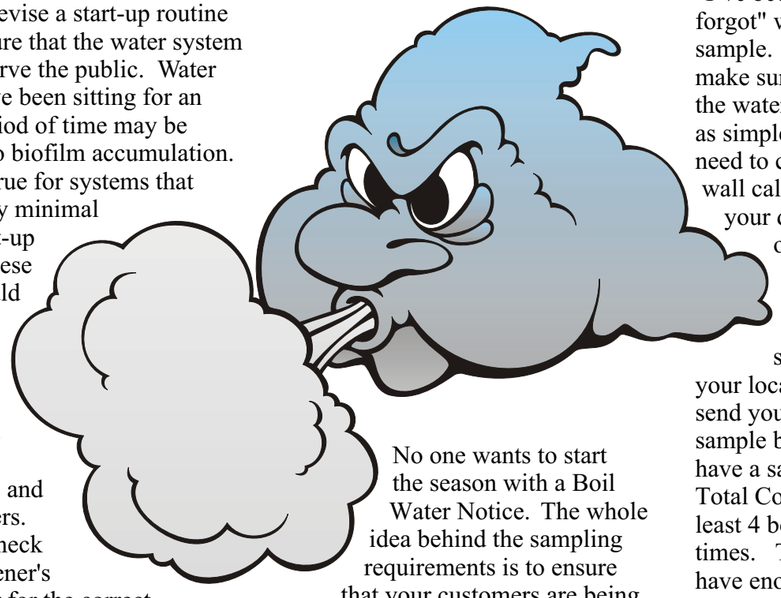
James Weise
Manager
Drinking Water and
Wastewater Program

This Issue

Total Coliform Monitoring for Seasonal Water Suppliers *by Linda Grantham*

State and Federal drinking water regulations require routine testing for all transient non-community water systems. These are systems that serve 25 or more persons per day, for at least 60 days out of the year. Many of these systems only operate for a few months during specified seasons.

Seasonal facilities have the same monitoring requirements as those who operate year round; however, the sampling requirements take on more importance for systems that have been closed down for a period of time. Systems that have been off line should devise a start-up routine that will ensure that the water system is ready to serve the public. Water lines that have been sitting for an extended period of time may be susceptible to biofilm accumulation. This is also true for systems that have had only minimal use. The start-up routine for these systems should begin with disinfecting the well and distribution system. This includes hot water heaters and water softeners. (Be sure to check with the softener's manufacturer for the correct procedure.) The most widely used routine disinfectant is regular household bleach. The amount needed is dependent on the depth of the well and the size of the water system. The complete disinfection procedure can be provided to those systems needing assistance by contacting your local DW/WW Program staff. Once the disinfectant has been flushed from the water system, a sample for Total Coliform Bacteria analysis should be collected and sent to the lab for testing. It is important to note that bleach (chlorine) used as a disinfectant may cause discoloration of the water as it oxidizes organic material and precipitates iron. Sampling and analysis needs to be completed before the system is opened to the public and should allow for the time to deal with any unsatisfactory results should they occur. That means time to collect and analyze more samples if necessary. **DON'T WAIT UNTIL THE LAST MINUTE! BE PROACTIVE!**



No one wants to start the season with a Boil Water Notice. The whole idea behind the sampling requirements is to ensure that your customers are being served safe water. The type and condition of a water system determines the sampling frequency. Most systems are only required to sample once per calendar quarter while the system is in operation. That usually works out to about 2 samples per year for the seasonal systems. Sampling early in the quarter is **highly** recommended. As an example, a summer seasonal operation that opens to the public the end of May or the beginning of June. The first sample needs to be collected **PRIOR TO OPENING**. The next sample should be collected in July or the beginning of August, about midway through the current years operation. Collecting a sample at the end of the season is discouraged because you're getting information after the fact. It may keep you from getting a monitoring violation, but the object here is to ensure that the water being served to your customers is safe.

We've heard many excuses such as "I've been too busy," and "I just forgot" when we call about a missed sample. But are you too busy to make sure people don't get sick from the water you serve them? It can be as simple as marking the days you need to collect your samples on a wall calendar and taping it above your desk or on the door to your office. **The bottom line - be proactive, not reactive.**

At the beginning of the season you should contact your local laboratory and have them send you at least a half a dozen sample bottles so you will always have a sample bottle on hand. The Total Coliform Rule requires that at least 4 bottles be on hand at all times. This is to ensure that you have enough containers should a routine sample test positive for total coliform bacteria and you are required to collect 4 repeat samples within 24 hours of notification.

Summer (or winter) seasons are usually quite hectic and require a lot of work to make them go smoothly. A little planning always makes those little tasks seems so much easier. So, plan ahead and have a healthy and profitable season. ~

Drinking Water and Wastewater Program Fees *by David Khan*

Did you ever ask yourself who authorized Drinking Water and Wastewater Program fees and for what services?

The Alaska Legislature requires state agencies to charge fees for specific activities. The Drinking Water and Wastewater Program of the Department of Environmental Conservation charges fees for designated regulatory services such as drinking water and wastewater engineered plan reviews, waivers, determinations, permits, inspections, and sanitary surveys. These services protect public health, the integrity of public and private drinking water systems, and protect the environment from diseases transmitted by domestic wastewater.

Are you curious about the process that was used to assess fees? Are the fees assessed objective and fair?

The DW/WWProgram fees assessment is based on the average amount of time staff spends on the various activities for a period of a year, based upon several years worth of time tracking data. This systematic and rational approach of collecting the statewide cost data to arrive at average fees is objective as opposed to any local subjective criteria. Moreover, the fees charged for specific activities are lower than the prevalent private industry rates for similar tasks.

Why do applicants have to pay fees instead of the State providing free services?

The Legislature does not provide sufficient general funds to the DW/WW Program to complete it's required public health tasks and provide for free services. The collected fees are deposited into the State's general fund, which pays a portion of the operating budget of the Drinking Water and Wastewater Program for administering its public health duties.

It is true, paying fees is frustrating and hurts the wallet, however, the fairest way to fund the Program's public health objectives is to charge those who benefit from the services.

Can the Drinking Water and Wastewater Program properly function without the fee revenue?

No, without the program receipts received from fees, the DW/WW Program would not be able to adequately ensure the protection of the drinking water and control wastewater pollution that could lead to waterborne illnesses. Without establishing and consistently implementing minimum treatment and construction standards for drinking water and wastewater systems, public health will not be properly protected and potentially costly contamination of the environment will occur.

A poorly designed and improperly maintained on-lot domestic wastewater system can contaminate a near-by drinking water well that could be yours or your neighbors. This could potentially lead to the large-scale contamination of a drinking water aquifer and a significant public health risk to nearby residents and their visitors. The DW/WW Program services do cost a little, but they are worth significantly more than their costs. For instance, it only costs $270 to review your on-lot wastewater system such that if properly constructed and maintained, should not contaminate your drinking water well. However, it could cost you hundreds of dollars in doctor visits if you get sick by consuming water from a well contaminated by a wastewater system that did not go through the program's review. We believe that it is better to spend a little now to correctly install a water and wastewater system, instead of a lot more later. Again, our repeated theme is: be responsible, be accountable, and be proactive.~

We're just checking... Does anyone read the Northern Flows? If you do, please send us an E-mail at northernflows@envircon.state.ak.us.

Filtration Technologies cont'd *by Lee Johnson*

cake is washed away, and a new DE precoat is applied for another filter run. The regulatory standards for a DE filter are turbidity less than 1 NTU in 95% of the samples and at no time over 5 NTU.

An advantage to DE filtration is its effectiveness at removing *Giardia lamblia*, receiving 99% (2-log) efficiency credit. No chemicals are used in the process and it is well suited for intermittent operation.

A disadvantage to DE filtration is the need for a high level of operator attention and maintenance. It can have higher operating costs than other filtration technologies. After a filter run the filter cake must be removed, and this results in a sludge that must be disposed of. There is only one water system in Alaska using DE filtration.

Alternate filtration is generally intended for the highest quality source waters, less than 5 NTU, and ideally less than 1 NTU. Most systems consist of cartridge and/or bag filters although this classification also includes microfilters and membranes, and any other filter process not covered by the other descriptions. Alternate systems often include a series of prefilters, either cartridges or bags or even pressure sand filters, prior to a *Giardia* barrier filter. The state maintains a list of approved *Giardia* barrier filters. These are filters that have been proven to be at least 99% (2-log)effective at removing *Giardia*-sized particles. The regulatory standards for alternate filtration is the same as for SS and DE, turbidity less than 1 NTU in 95% of the samples and at no time over 5 NTU.

Advantages to cartridge/bag alternate filtration systems include relatively low capital costs, ease of operation, and a small footprint needed for the water produced. They are often easily added to an existing treatment system in the form of modules to improve protection against *Giardia*.

Disadvantages include the inability to treat a wide range of water qualities. Without adequate prefiltration, they are prone to plugging from turbidity, algae, and other biological contaminants. Replacement filters are expensive and may need to be changed frequently. Filters are not very effective at removing suspended solids and reducing turbidity, resulting in potentially higher finished water turbidity than the other technologies. Cartridge/bag systems require the operator to handle the individual filters resulting in potential contamination of the new filters as well as exposure of the operator to the biological contaminants found on the used filters.

More information on filtration in Alaska can be found in the Alaska Water Treatment Guidance Manual and the Alaskan Water Treatment Systems, Intermediate Operator Training Manual. ~

Children and Drinking Water cont'd *by Kathy Kastens*

ATTAC, contact Nicole Duclos at 1-888-750-3823 or send her an E-mail at nicole.duclos@uas.alaska.uas. For the AWWMA contest, please contact Abigail Ogbe at (907) 451-2136 or send her an E-mail at abigail_ogbe@envircon.state.ak.us; or you can contact Brenda Wynne at (907) 269-6283 or send her an E-mail at brenda_wynne@envircon.state.ak.us.

To help keep everyone updated on each school's PWS public health and compliance progress we will be giving each school with their own PWS a report card, every quarter starting in January of 2003, so be ready. Does your school have an A+ system? Lets have fun with this project and see how far we can go.

Please contact me, Kathy Kastens at (907) 269-7639 or send me an E-mail me at: kathaleen_kastens@envircon.state.ak.us if you would like more information on our public water systems and drinking water in our schools project. ~

Filtration Technologies *by Lee Johnson*

In 1993 Alaska adopted its version of the Surface Water Treatment Rule (SWTR). The SWTR formalized the definitions of different filtration technologies. The purpose of this article is to provide you with basic descriptions of the various filtration technologies, the water quality they are intended for, and some of the advantages and disadvantages of each.

All filtration technologies for treating surface water sources were defined as either conventional, direct, slow sand, diatomaceous earth (DE), or alternate. Table A lists the different technologies and gives the water quality conditions they are generally capable of treating. Note: This table is adapted from information provided in the Alaska Water Treatment Guidance Manual.

TABLE A

Technology	*Turbidity (NTU)*	*Color (CU)*
Conventional	No Limit	<75
Direct	< 7-14	<40
Slow Sand	<10	<10
Diatomaceous Earth	<5	<5
Alternate	<1	<5

Conventional filtration is appropriate for treating a wide range of source water qualities and is the technology of choice for treating sources of poor quality, to include high turbidity and high color. This filtration technology is a series of processes that includes coagulation, flocculation, sedimentation, and filtration. Typically, a conventional system would use a coagulant followed by a mixer to rapid mix the chemical(s) into the water. The water then goes to the flocculation stage where the water is slowly mixed, allowing a large floc to form in the water before it moves on to the sedimentation stage. Water then moves through the sedimentation basin slowly, allowing time for the heavier floc to settle out of the water column. Water flows out of the sedimentation basin to the filter(s). Ideally, most of the particulates have been removed by this time and the filter only needs to filter out those particulates that did not settle. The current regulatory limit for turbidity for a conventional system is 0.5 NTU 95% of the time. This has been reduced for large systems (population served greater than 10,000) to 0.3 NTU, and will be reduced to 0.3 NTU for the smaller systems in 2005. For a conventional filtration plant to be considered optimized, the filtered water should have a turbidity level of less than 0.1 NTU on a continuous basis.

The advantage of this technology is the ability to effectively treat the poorest quality source water. It has been proven to provide a high level of protection from pathogenic organisms such as *Giardia lamblia* and is generally credited with a 99.7% (2.5 log) removal efficiency. Many coagulants are available for use with this technology to address different water quality problems. The operator often has a lot of flexibility in controlling the treatment process through changes to specific coagulant types or doses of coagulants, changes to mixing energy, controlling the speed of the flocculation mixing paddles, and adding flocculation aids or filter aids. Water almost always flows through the conventional filtration plants by gravity so the different treatment processes are exposed and can be visually inspected. Also, the efficiency of the settling process in the sedimentation basin is often improved by the addition of tube settlers. Tube settlers are generally bundles of rectangular tubes set into the basin at an angle. The treated water flows upwards through the tubes. The tubes reduce the distance the floc has to settle before it is no longer suspended in the water, and slides down the sides of the tubes.

Disadvantages to this technology include the size and complexity of the system. Choosing the correct coagulant or combination of coagulants to achieve the desired water quality can be complex, and both time and labor intensive. In addition, the chemicals used for treatment must be stored and handled safely. In some cases, a significant percent of the water produced is used for backwash, and disposal of the backwash water can require additional permitting or treatment. This technology generally has the most instrumentation , requires comprehensive monitoring, and the greatest reporting requirements. Also, a high level of operator knowledge, certification, and attention is required to operate these

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Filtration Technologies cont'd *by Lee Johnson*

systems.

Direct filtration is appropriate for treating water with lower turbidity and color than conventional filtration, generally less than 14 NTU and 40 CU. It is similar to conventional filtration except that the sedimentation process has been removed. Direct filtration systems can be designed to operate either under pressure or by gravity, and may or may not have a flocculation process. For a direct filtration system the water goes directly to the filter after the coagulant has been added and mixed. Some systems have a flocculation step added to allow more time for floc to form when treating cold water. The idea behind the direct filtration process is to have very small floc that is filtered throughout the depth of the filter media rather than settleable floc. If the floc is too large it will quickly plug the surface of the filter media and result in short filter runs and frequent backwashes. The regulatory performance requirements for this technology are the same as for conventional filtration and the operational requirements are almost as complex.

Advantages to this system is that it is smaller for a given flow rate than a conventional system, because the sedimentation basin has been excluded. It works well in a pressurized configuration thereby reducing pumping costs and allows some flexibility to respond to changing source water qualities. It is capable of effectively removing at least 99% (2-log) of *Giardia lamblia* and producing high quality, low turbidity water.

Disadvantages are similar to those of conventional filtration regarding chemical storage and handling, operator knowledge, monitoring and reporting requirements, and backwash issues. With pressure filters, the filtration process often cannot be seen. Inspection of the media typically requires unbolting an inspection hatch. As noted in Table A, it generally does not have the capability to treat sources with the highest turbidity or color.

"COAGULATE - to cause transformation of a liquid to a soft semisolid or solid mass."

Slow Sand (SS) filtration requires a better quality source water than conventional or direct filtration, with turbidity less than 10 NTU. It is a process where water is filtered through a layer of sand at a very slow rate, often 50 to 100 times slower than conventional or direct filtration. This slow rate allows a surface mat, or "schmutzdecke," to form on the surface of the filter. The schmutzdecke is made up of filtered matter and microorganisms. The regulatory standards for a SS filter are turbidity less than 1 NTU in 95% of the samples and at no time over 5 NTU.

The advantage to SS filtration is in its simplicity. There are no chemicals applied, and no backwashing. The process produces consistent water quality once the schmutzdecke is formed, and has long filter runs (weeks or months depending on water quality). It is effective at removing *Giardia lamblia* with a removal efficiency credit of 99% (2-log).

Disadvantages include the need for a very large filter area and therefore a larger building due to the slow filtration rate. It must be continuously operated and is limited in the range of water qualities it can treat. At the end of a filter run the filter must be drained and one inch of the surface sand is scraped off. Once back in operation it may be days before the schmutzdecke forms on the surface of the sand filter and it produces good quality water. Because of the long down time required of a slow sand filter for cleaning and ripening, more storage capacity or an additional filter is required. For these reasons and the high costs associated with constructing them, there is only one SS filtration plant operating in Alaska.

Diatomaceous Earth (DE) filtration can be used to treat source water with turbidity up to 5 NTU. DE filtration is a process that uses fossil diatoms (microscopic aquatic plants) as a filtering medium. Systems are either pressure or vacuum-operated and consist of a vessel containing a number of filter elements on which a precoat of a DE slurry has been added. This DE precoat filters out particulates as the water passes through it. DE is continuously added during the filtration process to maintain the integrity of the filter medium. Once the headloss becomes too great (requires very high pressure to push water through the filter), the filtration process is stopped, the filter

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My Point of View - Rules, Regulations, and Public Health Protection *by David Litchfield*

I am one of those state regulators. There are a number of problems associated with being an enforcement officer with the Alaska Department of Environmental Conservation and one of those problems is that there are so many regulations. (But I guess as owners/operators of water and wastewater systems, you already know that). Although my priority is protecting public health, I do spend time enforcing regulations that may not seem to apply directly to safe drinking water. Examples of these regulations include consumer confidence reports, certified operator requirements, operator reports, and sanitary surveys. These regulatory requirements are important because they inform the water users (customers, visitors, and the general public) about water quality, and verify that the water system operators can do their job in facilities that are appropriately equipped. So, whether directly or indirectly enforcing regulations, the bottom line goal is **safe water**. Many compliance issues are based on federal mandates. Most of the drinking water mandates are funded from special grant appropriations, such as the Drinking Water State Revolving Fund; however many federal mandates are unfunded. The U.S. Environmental Protection Agency (EPA) is ultimately responsible for the enforcement of laws passed by Congress (such as the Safe Drinking Water Act Amendments of 1996). However, EPA has passed this enforcement responsibility (primacy) on to states like Alaska so the regulations can be "customized" to fit the unique situations of the states and the EPA regions. Basically, I get my paychecks indirectly from EPA grants and must work cooperatively with EPA to ensure compliance with the primacy requirements in ways that make sense for Alaska. The relationship with the staff of EPA Region 10, although demanding, has become much more of a partnership with realistic goals.

Another partnership that has developed, is the one I have with public water system owners and operators. I try to make compliance as non-confrontational as possible. I am pleased with what we have accomplished by working together. I have been doing this job for over ten years and I have seen a steady improvement in the professionalism of public water system owners and operators. The regulations may have propelled this improvement but the water system owners and operators have stepped up to the plate and delivered a quality product without me getting on their case. And for this cooperation and dedication, I want to thank all of you. Having said this, has my job gotten any easier? No! It hasn't because my job has changed and is always changing, as priorities within the DW/WW Program are re-evaluated.

Protecting public health is why I do what I do. I take pride in knowing, that if you are at, or are being served by a regulated public water system on the Kenai Peninsula, you can confidently drink the water. Providing safe water is my job, but it's your responsibility. ~

There are more than 3,000 rivers in Alaska and over 3 million lakes. The Yukon River, over 2,000 miles long, is the third longest river in the U.S. These rivers and lakes are considered surface water sources and there are 480 Public Water Systems in Alaska that use these as a source of their drinking water.

Tech Tip - Do you know about Well Casings? *by Mike Skibo*

The only pre-appproved method of grouting a well is to provide 10 feet of continuous grout within the first 20 feet below the ground surface. A cased well must be grouted with a watertight cement grout, sealing clay, bentonite, or like material as follows:

At least 10 feet of continuous grout within the first 20 feet below the ground surface; or

Alternate method of grouting, if the Department determines that the alternate method
- serves the interest of public health; and
- achieves protection equivalent to that provided by at least 10 feet of continuous grout within the first 20 feet below the ground surface.

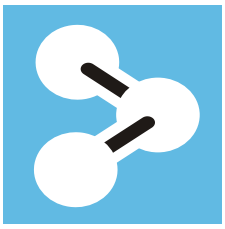
The department must review and approve any proposed alternative method of grouting before construction begins. ~

What Type of Arsenic is in my Drinking Water? *by James Weise*

Lets have a "plain English" discussion about arsenic. Arsenic is a semi-metallic element, the 20th most abundant element in the Earth's crust, and the 12th most common element in the human body. As with most metals, it "bioaccumulates" which means the level keeps increasing in organisms over time. That is what ultimately makes arsenic so harmful to humans. I am not talking about science fiction here, just basic science and chemistry of naturally occurring arsenic in the water around us.

The ADEC DW/WW Program is actively involved in two applied research and technology projects with the University of Alaska Anchorage (UAA), Applied Science, Engineering, and Technology Laboratory (ASET) and the School of Engineering (Dr. Craig Woolard). Both research and technology projects focus on arsenic in drinking water. UAA ASET has obtained a grant from the Natural Resources Fund to complete an arsenic speciation project. ADEC DW/WW Program will be contributing staff for the project to collect samples, test arsenic field test kits, test the drinking water for total arsenic, and contact the selected public water systems (PWS) for sampling.

How much naturally occurring arsenic do you have in your drinking water and what kind of arsenic is it? Arsenic is found in two basic forms in drinking water: organic and inorganic. The inorganic forms of arsenic are the most harmful to human health. When you collect a drinking water sample and have it tested for arsenic, the lab provides the results to you as "Total Arsenic." The Maximum Contaminant Level (MCL) is based on the total arsenic result. With sophisticated instrumentation, "Total Arsenic" can be broken down into the different species of arsenic that combine to give you the total arsenic in your drinking water. The two most common species of inorganic arsenic are:



arsenate and arsenite, the most common species of organic arsenic is arsine.

The arsenic speciation project will focus on identifying the most prevalent species of arsenic in the ground water used by both public water systems and private wells in the Municipality of Anchorage, Sand Lake area. Heather Newman, in the ADEC Anchorage Office, is coordinating this project area for the DW/WW Program with UAA. For this project, we will sample the raw water from approximately 20 - 25 wells and determine, from both field tests and laboratory analyses, the "Total Arsenic" as well as the levels of the arsenate and arsenite species. Our primary goal with this project is to try and characterize the ground water in a specific area to better assist utility owners in planning for the design of new treatment options to remove arsenic from their drinking water to meet the new Arsenic MCL of 0.01 mg/L (10 ppb). Arsenate is the more easily removed species of arsenic; however, arsenite is the most readily soluble under most "normal" ground water conditions, and is the more harmful variety of arsenic to human health. Additionally, for the arsenic speciation project, DW/WW Program staff will be field-testing a "Low Range Arsenic Quick Test Kit" obtained from Industrial Test Systems, Inc. of Rockhill, South Carolina. These test kits have been used in the contiguous United States, and the results from field test use, when compared to laboratory analyses, have been favorable. However, the "Low Range Arsenic Quick Test Kits" have not been used in a cold climate or cold water environment, so Alaska provides a great opportunity to test the effectiveness of these kits. After the arsenic speciation-sampling project has been completed for the Sand Lake area, we plan to do a similar project in the Fairbanks and North Pole areas. Cindy Christian, in the ADEC Fairbanks Office, will be coordinating this project area for the DW/WW Program with UAA.

The other applied research and technology project that the ADEC DW/WW Program is actively working on with the UAA, School of Engineering (Dr. Craig Woolard), is the National Sanitation Foundation (NSF) Environmental Technology Verification (ETV) review of two Alaska-designed arsenic treatment technologies for Alaska's small PWS. This is a jointly funded and staffed project between UAA, School of Engineering; NSF International, Inc.; and the ADEC DW/WW Program. The arsenic treatment technologies that will be reviewed in detail for NSF ETV approval are "Arsenic Co-precipitation using Ozone" and a "Coagulation Loop." Obtaining NSF ETV approval for these technologies will allow the treatment technologies to be more cost

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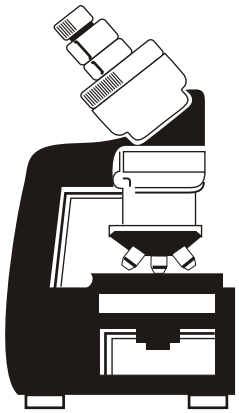
What Type of Arsenic is in my Drinking Water? cont'd *by James Weise*

effective and affordable for small Alaska PWS's because they should be able to reduce their system design, review, and approval costs. This is a "win-win" for PWS owners, their consultants, and the ADEC DW/WW Program staff. I will provide updates in future issues of the *Northern Flows* newsletter as we progress on these projects and hopefully open the door for future NSF ETV applied drinking water research and technology projects for the State of Alaska.

Now that I have your attention, I just want to remind those Class A PWS that I sent a letter to this past January 29, 2002, to collect a raw water sample from their system and send it to a ADEC-certified lab for



arsenic analysis. The analytical results need to be sent to your local ADEC Drinking Water and Wastewater Program Office. That information along with the information obtained from our arsenic speciation project will allow all of us to be better prepared and should enable us to make more informed decisions on how to remove arsenic, when and where necessary, with the least amount of cost and space. If you haven't collected your sample yet, don't put it off any longer, please do it NOW. The maximum contaminant level (MCL) for arsenic in drinking water for public water systems was lowered from 0.05 mg/L [50 parts per billion (ppb)] to 0.01 mg/L (10 ppb) effective February 21, 2001. All Class A PWS (Community Water Systems and Non-transient Non-community Water Systems) must be in compliance with this MCL by January 23, 2006. As a public water system owner it is your responsibility to be **PROACTIVE** in your approach to greater public health protection and prudent long term planning for your water system. ~

Children and Drinking Water *by Kathy Kastens*

As you all know from our last newsletter, the ADEC DW/WW Program has an ongoing project working with schools that have their own PWS. There is a large and growing problem we are trying to solve - 80 out of over 130 schools statewide with their own PWS's had violations in 2001. Part of what we are trying to do with this project, is involve the students, teachers, parents, principals, and school boards in the solution. In order to do this, we need to let them know, not only what the problem is, but what we do. They need to know what "we" the regulators, and "we" the operators of the system are supposed to do, and what the school itself must do to provide the operator with the tools they need to do their job. We're trying to accomplish this in several different ways, and you can help.

One activity we're doing is making curriculum available to science teachers. If you know any teachers, ask them to contact us. The DW/WW Program will have a website soon with links to several places where curriculum can be found. The Alaska Technical Training Assistance Center (ATTAC), located at the University of Alaska Southeast, Sitka, has secondary school curriculum on their website, with lab experiments including a suggestion to take a field trip to the local Water or Wastewater plant. ATTAC will even lend science teachers some of the equipment and supplies they need to do the experiments. ATTAC's curriculum can be found on the web at: http://www.geocities.com/water-alaska/activitymanual.html

One of the other ways we can get the children involved is through poster and essay contests. ATTAC and the Alaska of Water Wastewater Management Association (AWWMA) are both sponsoring contests this year. Winners of the contests receive cash awards, travel to the AWWMA conference in the spring, and **tuition at the University of Alaska**. These are great opportunities for the children. So if you know children, or teachers that are interested, please get them involved. You may even want to offer your system for a field trip, let the children know what you do and how important your job really is. To get more information on the contest sponsored by

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